

REMARKS

The present Preliminary Amendment is made pursuant to comments and suggestions made by the Examiner during a brief telephone interview on June 28, 2004. The Examiner is thanked for his helpful comments.

Claims 1-22 remain pending in the present application. Claims 1, 8-15 and 20 have been amended. Claim 23 has been canceled. No claims have been added. Applicants believe claims 1-22 as presented herein patentably distinguish over the cited art and are allowable in their present form.

I. 35 U.S.C. § 103, Obviousness

In the Final Rejection dated April 5, 2004, claims 1-23 were under 35 U.S.C. § 103(a) as being unpatentable over Voigt et al. (U.S. Patent No. 5,960,451) and Jacobson et al. (U.S. Patent No. 5,392,244) or Kirby (U.S. Patent No. 6,526,478), each taken separately. In rejecting the claims the Examiner states the following:

Voigt teaches the claimed “one or more hosts” as computer 22 and/or computers coupled to network 36. The claimed “plurality of data storage elements” correspond to memory 44, 42 and data storage system 24. The claimed “host network attachment” corresponds to circuitry inherently found in computer system 20 for connecting the memory to the network. The claimed “storage server/controller” corresponds to circuitry including RAID management system 56 and/or controllers 54a, 54b. The claimed “permanent data storage media” corresponds to non-volatile memory 44. The claimed “management information” corresponds to parameters/preferences such as physical capacity, number of storage disks, allocated capacity, characteristics of the RAID, percentage to be used (col. 2, line 55 – col. 3, line 2), performance (col. 4, line 16) and availability (col. 7, lines 26-42). The claimed “units of data” corresponds to the logical storage units (LUNs). The claimed function of “management information may be manipulated” corresponds to

altering characteristics/parameters of the RAID or logical storage units (LUNs).

Office Action dated April 5, 2004, page 3.

The Examiner acknowledges that Voigt does not disclose “virtualization means for converting a storage request to a virtual volume into a storage request to at least one data storage element of said plurality of data storage elements” as recited in claim 1 of the present application. The Examiner asserts, however, that the claimed virtualization means is disclosed in both Jacobson and Kirby, and contends that it would have been obvious to one of ordinary skill in the art to use Jacobson’s or Kirby’s memory mapping scheme in Voigt to improve I/O performance. This rejection is respectfully traversed.

Claim 1, as amended herein, reads as follows:

1. A virtual stored data management system, the virtual stored data management system comprising:
 - one or more hosts;
 - a plurality of data storage elements functionally coupled to the one or more hosts, wherein the plurality of data storage elements include a host network attachment, a data transfer system, at least one of a storage server and a controller, and a permanent data storage media, wherein the permanent data storage media is organized with management information uniquely associated with units of data such that the management information may be manipulated at a plurality of nodes that are in a plurality of different locations within the virtual stored data management system substantially simultaneously; and
 - virtualization means for converting a storage request to a virtual volume into a storage request to at least one data storage element of said plurality of data storage elements.

During the above-mentioned telephone interview on June 28, 2004, the Examiner suggested amending claim 1 to more clearly recite where the management information is manipulated in the virtual stored data management system. By the present Preliminary Amendment, accordingly, claim 1 has been amended to clarify that the management information is manipulated at a plurality of nodes that are in a plurality of different locations in the system. As indicated in the specification, for example, at page 27, lines 7-11, the present invention allows the system to distribute the workload more evenly and to improve system performance.

Voigt does not disclose or suggest a virtual stored data management system that includes a permanent data storage media “organized with management information uniquely associated with units of data such that the management information may be manipulated at a plurality of nodes that are in a plurality of different locations within the virtual stored data management system substantially simultaneously” as now recited in claim 1. Voigt does not disclose that management information may be manipulated at a plurality of nodes that are in a plurality of different locations within a virtual stored data management system, and does not disclose that the management information may be manipulated at the plurality of nodes substantially simultaneously.

Voigt is directed to a hierarchical RAID data storage system, and, in particular, to a system for reporting available capacity and current RAID configuration to an administrator so that the administrator can make informed decisions concerning creation or reconfiguration of current logical storage unit (LUN) characteristics. In Voigt, an administrator can propose different configurations with one or more hypothetical LUNs without actually creating the LUNs. The system reports changing available capacity as the administrator varies the characteristics of the hypothetical LUNs; and, assuming available capacity, the administrator can create new LUNs having the same characteristics as the hypothetical LUNs.

Voigt is concerned with how characteristics/parameters of the RAID or LUNs are to be altered to change available capacity, i.e., how information is to be manipulated. The present invention, on the other hand, is directed to where management information may be manipulated. Voigt is not concerned with where the processing of management information takes place in a data management system and does not disclose or suggest that management information may be manipulated at a plurality of nodes that are in a plurality of different locations within a virtual stored data management system substantially simultaneously, as now recited in claim 1. Only the present application contains any such disclosure.

Jacobson and Kirby were applied as disclosing the claimed “virtualization means” of claim 1. Jacobson and Kirby also do not disclose or suggest that management information may be manipulated at a plurality of nodes in a plurality of

different locations within a virtual stored data management system substantially simultaneously; and, thus, fail to supply the deficiencies in Voigt. Accordingly, the cited art, considered alone or in combination, fails to disclose or suggest the subject matter of claim 1, and claim 1 should be allowable in its present form.

Claims 2-22 depend from and further restrict claim 1 and should also be allowable in their present form, at least by virtue of their dependency. Many of these claims have also been amended herein to properly depend from amended claim 1 and to provide greater clarity.

Therefore, the rejection of claims 1-23 under 35 U.S.C. § 103(a) has been overcome.

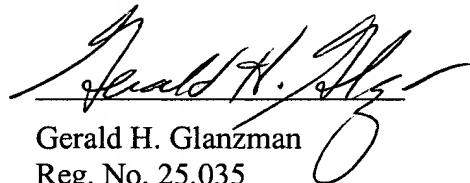
II. Conclusion

It is respectfully urged that claims 1-22 patentably distinguish over Voigt in view of Jacobson or Kirby and that this application is now in condition for allowance. It is, accordingly, respectfully requested that the Examiner so find and issue a Notice of Allowance in due course.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,



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